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Prairie Update

A publication of the Saskatchewan Watershed Authority Volume 22 Winter 2005

North West Environmental Stewardship Program

The Saskatchewan Watershed Authority is leading the North West Environmental Stewardship Project, a new partnership between producer-based organizations and agencies aimed at developing and implementing a coordinated riparian, rangeland and tame forage management extension program for North West Saskatchewan.

"This area of Saskatchewan has the highest densities of wetlands and watercourses in the province, as well as the highest concentration of cattle," said Jeremy Brown, a Range Ecology Technician with the Saskatchewan Watershed Authority in North Battleford who is coordinating the project.

"We are working with producers in the North West to identify beneficial farming and grazing practices for lands adjoining wetlands and waterways."

Partners in the project include the Saskatchewan Watershed Authority, Ducks Unlimited Canada, Saskatchewan Agriculture, Food and Rural Revitalization, Agriculture and Agri-Food Canada – Prairie Farm Rehabilitation Administration, the Saskatchewan Soil Conservation Association and the Western Applied Research Corporation.

By pooling resources, these partners will be able to work with producers to help them adopt positive, sustainable riparian and rangeland management practices.

"What we want to do is encourage landowners to get involved in riparian protection," said Brown.

"Right now we're meeting with producers in the area to talk about their current farming and ranching practices by water bodies, as

well as taking a look at the health of their riparian areas and rangelands as they are now."

Brown is also working with local producers to identify potential sites which could be used to demonstrate grazing management and pasture rejuvenation, as well as shoreline management options. These projects will enable producers to see first-hand the positive impacts of various beneficial management practices.

"We're also going to be organizing two workshops on land management this winter, and two field days once it warms up. That way more local producers will have an opportunity to see the benefits of using these management practices, and may try them on their own land," said Brown.

"At the end of the day, we see this project resulting in increased environmental benefits for the North West Saskatchewan area."

Each partner group will contribute to the delivery of the North West Environmental Stewardship Project, which has also received support from the Government of Canada's Greencover Canada program.



Jeremy Brown is excited about his position as Range Ecology Technician with the Saskatchewan Watershed Authority. "It's great to be working in my own corner of the province, with producers, and on issues I feel are so important," he says. Jeremy coordinates and delivers the workplan for the North West Environmental Stewardship Program. He has returned from two years spent working in Alberta since receiving a degree in Animal Science from the University of Saskatchewan. Jeremy is now back on the mixed farm where he was raised in the Cut Knife area. He understands the issues that producers are facing, and still believes there is lots of potential in the industry. For example, "by adjusting our grazing management, we can extend the grazing season on our pastures while maintaining them for the long term and protecting natural and riparian areas." Jeremy looks forward to working with producers in the North West over the next four years.

Saskatchewan's riparian areas (the transition zones between water and upland areas) are an invaluable part of the province's ecological health. These areas are often able to support unique plant communities made up of shrubs, trees, grasses, sedges, rushes, and forbs, as well as providing forage and wildlife habitat. Riparian areas also perform important environmental functions such as trapping sediment, filtering nutrients, producing more vegetation, slowing water flows, controlling erosion, stabilizing streambanks and recharging groundwater. These functions provide numerous benefits for both land and water users, including clean, abundant water, vital wildlife habitat, improved livestock performance and opportunities for herd expansion.

Road House Ranch

Submitted by Myron Wiebe, Neilburg



Road House Ranch, that's what we call it. A little house at the end of the road that has grown in size over the years. Within its walls is a home, one of the richest treasures given to mankind.

Being at the end of the road doesn't put us at the end of the world. Rather, it is the beginning of a completely different environment. We live where the land transforms from arable to non-arable: black loams and clays to sand and blow sand; top soils from three inches to next-to-none; blow holes eroded out of the sand by wind usually caused by surface disturbance, either man, animal or sometimes nature itself. It is in this environment that the native grasses take their root and thrive, holding down the soil and providing forage for many different species, domestic and wild. The ongoing challenge is to find and keep the balance between utilization and sustainable plant health.

If one could drop our cow numbers in half, it could be a lot easier to attain (if we understood optimum grazing periods). However, we struggle with maintaining a viable size operation. I have heard "there is no one as broke as a rancher with no grass." I tend to agree. The drought of 2002 taught us that. We definitely learned the value of the reserve grazing we had in our scrub brush and buck brush. Certainly this is not a sustainable grazing practice as the cows eat all the grass first.

Ten years ago we recognized we needed to simplify our cow-calf operation from a labour perspective.

We also felt we needed to address the input cost side of our production. And then there is the need to be able to adjust cattle inventories according to weather conditions and grass production. Enjoying being a part of nature itself, we decided to adjust our cow-calf operation to coincide better with the cycles of nature.

The cows start calving in mid-May on pasture. We ride pastures once a day and check for problems. Heifers calve on pastures close to home to be watched a little closer. The cows are fed for two weeks in November to get the calves on feed. Usually the cows are locked up on weaning day for about five days and the calves are left in the weaning pasture with feed, where they are accustomed to their environment. This has worked very well. Cows then move out to chaff piles or swath grazing until April. Bred heifers and first calf heifers winter together at the home ranch with supplemented feed and grazing. Weaned calves are wintered at about 1 - 1.25 pounds per day average daily gain. In the winter we aim for healthy survival, not much more. These calves can either be marketed in spring as grazers or go on our own grass if conditions permit. This gives us the ability to adjust our cattle inventory without selling breeding stock. This sounds simple on paper but it does take some doing. Many times I wish I was more "proficient" at it.

One of the challenges is water for livestock. Our dugouts in the sand are down to the water table. This pretty much requires fencing and pumping

into troughs. It has extended dugout life expectancy considerably. In dry years it has made the difference between having water or not and increased water quality. We also have 5000 ft. of one-inch PVC water line buried from the well in the yard. This supplies four stock troughs watering 400 acres of tame grass.

Twenty miles north of the home place we rent a pasture. Very hilly and heavy clay, the only water out there is from a 300 ft. deep well. A dugout was dug on top of the hill close to the well for a reservoir. The cattle from six quarters were to walk to this dugout for water. One day studying this project I realized I was on the highest elevation of the entire pasture. Why not try a siphon line to other stock tanks? We ploughed in 3000 ft. of 1 1/2 inch line to feed two tanks. This has worked excellent. We can fill the line with the well pump, fix some valves and the line is changed. Shutting the little generator off that runs the pump still leaves us with 40 to 50 pounds per square inch at the stock troughs.

In the spring of 2004, Saskatchewan Watershed Authority approached us about a stewardship program partnership. This program has provided some funding to address sensitive environmental issues such as fencing out fragile lakeshore habitat. On a lakeshore where quicksand-like soil has claimed numerous animals, possibly the Authority will look at a partnership project developing alternative water supplies in these pastures.

If there is one thing I have learned, it is that water is the essence of life. For grass it comes in the form of rain and snow. We have no control over when it comes or how much will come. One thing we can control is how much is absorbed, how much runs or blows off. There is so much to learn. The rewards are so beautiful. "Grass waving in the breeze" - it is a picture of health.

- Myron Wiebe

Where does your water come from?

It may sound like a simple question with a simple answer. Here in Saskatchewan, it seems like water is everywhere, with unlimited availability. But the reality is that while northern Saskatchewan has an abundance of water, most of our population and demand is in the south. In any case, it's pretty seldom that we actually stop to think about where our water comes from or how it gets to us.

The availability of water is determined by climate characteristics, geology and landforms, and the hydrologic cycle. The hydrologic cycle is a world-wide circulation system in which water is evaporated from the earth's surface, condenses to form clouds and is returned to the earth as precipitation in the form of rain or snow.

When the precipitation reaches the ground surface, it may run off into streams, rivers, lakes and wetlands or soak into the ground and be stored in soil and rock formations known as aquifers, or be taken up by vegetation and transpired back into the atmosphere. This cycle provides the two primary sources for the water we use: groundwater and surface water.

Surface water is one of the primary sources for the water Saskatchewan people use each day, and includes that found in various water bodies such as lakes, rivers, streams, creeks, marshes, and so on. We have three primary surface water sources – mountain fed streams, Canadian Shield streams and prairie streams that depend on snow melt. On prairie streams, about 70 percent of the runoff occurs as the result of snowmelt in March, April and May. Streams arising in the Canadian Shield tend to have a more consistent flow year round, with a spring or early summer peak flow. Mountain fed streams are more dependable sources and usually of better quality. We have two main mountain fed rivers – the North and South Saskatchewan Rivers.

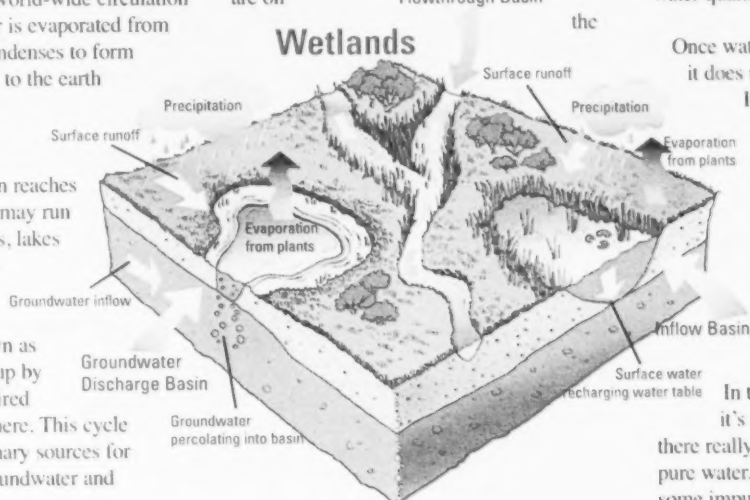
Runoff can travel either over the land or under the ground. As it flows down its course, some of it will be used by plants or

animals. Some will also return to the atmosphere through evaporation. And some will continue flowing along until it joins a body of water. From here we can pump the water, or divert it using dams and other water control structures, for various uses such as drinking, irrigation, and recreation, among others.

The North Saskatchewan River is part of the Saskatchewan River system and serves as a great example of a surface water system fed by runoff from the mountains. Its headwaters are on

Flowthrough Basin

Wetlands



eastern slopes of the Rocky Mountains including the Saskatchewan Glacier, a huge tongue of ice stretching off the massive Columbia Icefields in Jasper National Park. From there the river flows across Alberta and Saskatchewan where it joins the South Saskatchewan River east of Prince Albert. The Saskatchewan River flows eastward to Lake Winnipeg, into the Nelson River and eventually into Hudson Bay. The North Saskatchewan River passes through the major communities of Edmonton, North Battleford and Prince Albert. Along this path, hundreds of thousands of people use the water for everything from drinking to recreation to watering livestock.

Like the North Saskatchewan, most of our rivers cross provincial or international boundaries. Saskatchewan must share water with either an upstream or a downstream province, the Northwest Territories, or the United States. The manner of sharing is in

most cases based on an agreement between the jurisdictions. Typically, these agreements call for the upstream jurisdiction to provide 50 percent of the flow to the downstream jurisdiction.

Groundwater includes underground streams and reservoirs, often referred to as aquifers. They are supplied by water that trickles down through the soil until it comes to a hard, solid layer of rock or clay. The amount of water that seeps through the soil is determined by the soil type – lots of water will get through in areas where the soil is sandy and light, less so where the soil is heavily compressed or there is lots of clay. Generally, the deeper the aquifer, the more reliable the supply, but the poorer the water quality.

Once water hits an underground aquifer, it does not necessarily stay in one place.

It can move around, although very slowly, and some may gradually seep to bodies of water on the surface or to soils closer to the surface. We can tap into this water by drilling wells down into the aquifer. Approximately 45 percent of Saskatchewan residents get their drinking water this way.

In terms of the quality of our water, it's important to understand that there really is no such thing as naturally pure water. In nature, all water contains some impurities. Some, such as minerals, may be harmless. However, in some cases, minerals may be considered contaminants and may make the water look or taste bad, or even make it unsafe to drink.

It's also important to understand that people live and work on the land and watercourses that supply the water we use, and that our activities can have a definite impact on water quality. For instance, surface water flowing over the ground can pick up and carry along contaminants on the surface. In the same way, groundwater moving under the surface can transport contaminants that have seeped into the soil. And of course there's always the possibility of directly adding contaminants to the water itself, whether it's on the surface or in an aquifer.

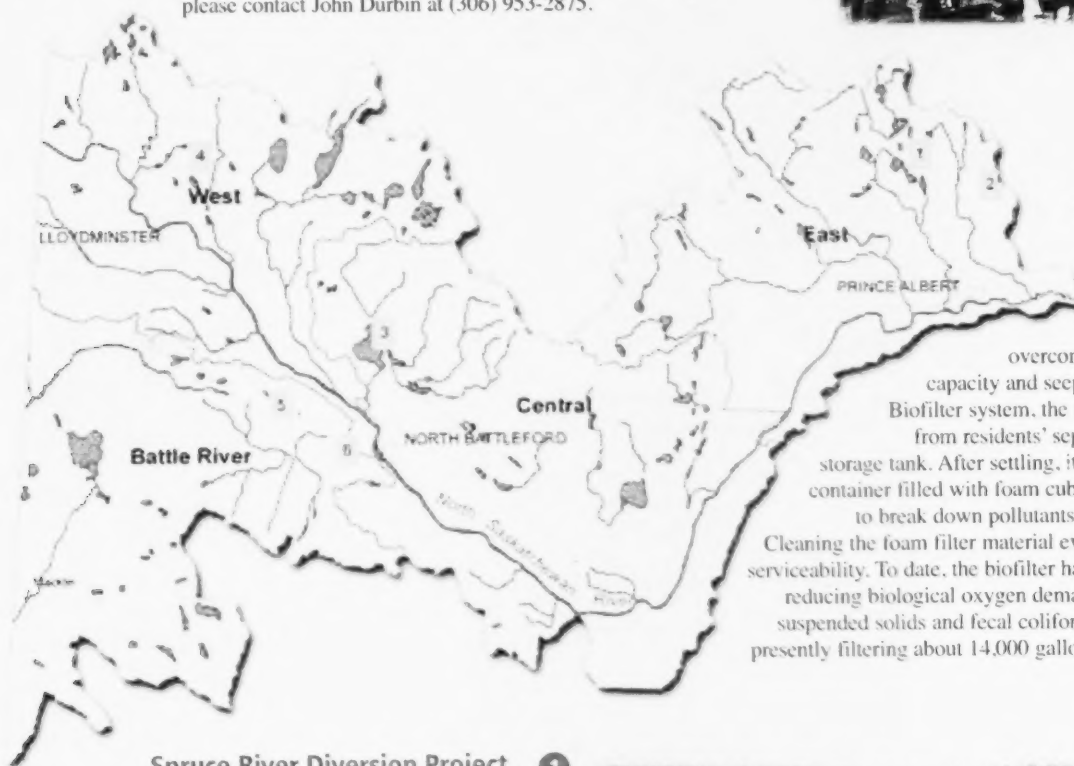
Knowing these things, we can take steps to manage our water resources and keep the water safe.

Focus On:

The North Saskatchewan River Watershed

The North Saskatchewan River Watershed incorporates a road diversity of water users and water-related activities.

Aside from having the highest densities of wetlands and watercourses in the province, as well as the highest concentration of cattle, this area supports a wide variety of recreational, industrial and agricultural uses. The North Saskatchewan River Watershed is one of seven priority planning areas in the province. In the summer of 2004, public bus tours were conducted of the four planning units of the North Saskatchewan River Watershed. These tours were designed to give participants a better understanding of water usage in their watershed. If you are interested in more information on activities in your watershed, please contact John Durbin at (306) 953-2875.



Paddockwood Sewage Treatment System

Paddockwood's unique system was installed last year to overcome concerns about lagoon capacity and seepage. Called the Waterloo Biofilter system, the system pipes liquid waste from residents' septic tanks to a community storage tank. After settling, it is then filtered through a container filled with foam cubes which contain bacteria to break down pollutants, pathogens and nutrients. Cleaning the foam filter material every five years restores its serviceability. To date, the biofilter has been very successful in reducing biological oxygen demand levels, as well as total suspended solids and fecal coliform bacteria. The system is presently filtering about 14,000 gallons/day from 67 residents.

Spruce River Diversion Project

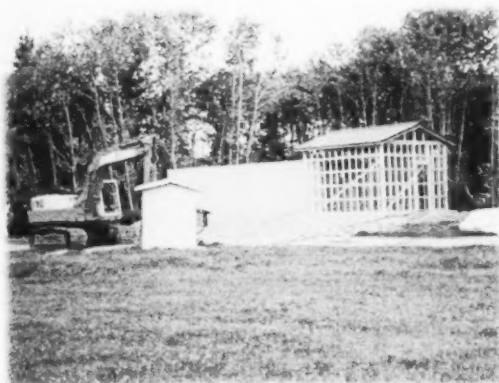
The Spruce River and Anglin, Emma and Christopher Lakes have long experienced extreme variations in seasonal water flow and levels. Alternating cycles of drought and flood over the years have impacted property owners and limited development in the area. The Spruce River Diversion Project was initiated in the 1950's to stabilize the water levels on Emma and Christopher Lakes. A pumphouse and one of several dams were constructed on Anglin Lake to divert water into a channel feeding Emma and Christopher Lakes. On average 2,500 acre feet of water is pumped from Anglin to maintain water levels on the other lakes.

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Jackfish and Murray Lakes

Due to evaporation, no lake outflow for the last several years and the contribution of groundwater, Jackfish Lake has become increasingly saline. This past spring, however, significant runoff decreased the salinity. Arsenic levels in both Jackfish and Murray Lake are much higher than expected. The Stewards of Jackfish and Murray Lakes have been involved in water quality monitoring and the development of several livestock watering projects to reduce impacts on inflow streams. A sediment sampling program is now being conducted to determine historic arsenic levels and trends in the lakes.



Atton's Lake Regional Park

The Regional Park golf course was previously irrigated from Atton's Lake. However, due to declining water levels and an increase in the conductivity (salt) levels, lake water was no longer a good option for irrigation. So a pump and pipeline were installed to pump water from the Battle River two miles away at a rate of 110 gallons per minute into a holding pond. Another pump is used to move water from the pond to the irrigation pump for the golf course. The last phase of the new system will be to install automatic irrigators which will save water from evaporation because the course will be watered at night.



6

Nelson Ranch

The original Nelson Project – the damming of a creek to create a wetland – was built in 1953. In 2002, the Nelsons contacted Ducks Unlimited for assistance in a stock-watering system. They wanted to prevent cattle from getting stuck in the mud, achieve greater weight gains, and experience better overall performance. Ducks Unlimited provided the materials to fence out the wetlands and Daryl Nelson had the fence constructed. A solar-powered watering system was installed for off-site watering away from the wetland.

Husky Oil Injection Plant at Bolney

Husky Energy's Bolney/Celtic thermal operation pipes about 4,200 m³ of water per day from wells adjacent to the North Saskatchewan River and uses this water to generate approximately 4,200 m³ of steam per day to thermally extract oil. The use of steam increases the amount of oil that can be recovered. For example, a non-thermal producing well extracts 8 to 12 percent of the available oil. At the Bolney site, current oil recovery rates are at 44 percent and growing.

The Bolney site produces approximately 11,322 barrels of oil per day using different thermal production methods. Almost all of the water and steam used to extract oil is recovered. The oil and water are separated and the "clean" water is injected into a water disposal in the Dina geological formation, located at a depth of approximately 900 metres below the surface.



Fencing Benefits Wildlife and Livestock

Danny Songer was looking for new ways to manage his pasture and the adjacent shorelines. Songer and his family run cattle along the south side of Lake Diefenbaker, north of Central Butte, and he had seen that past use on his land was affecting the productivity and health of his lakeshores and upland pastures.



Conversations with a relative in Rocky Mountain House who had built a paddock system on his pastures lead Songer to consider a similar setup on his land. Then a neighbour told Songer about the Prairie Stewardship program.

Songer signed up for the program, and with assistance from the Watershed Authority constructed 1.5 miles of fencing so that grazing could be deferred on the shoreline pasture. Now Songer can rotate his livestock through smaller paddocks for shorter periods, thereby improving the overall health of the pastures by minimizing the impact his cattle have during the grazing season and providing a longer recovery period.

"This paddock system has definitely lengthened our pasture time. It's a better way to do it. We're able to pasture more cattle on it," says Songer.

This area also provides habitat for the Piping Plover, an endangered cousin of the Killdeer that nests on the shores of Lake Diefenbaker. By deferring grazing on his shoreline pastures, Songer protects the Plovers' habitat during the crucial period between when their young hatch and when they are able to leave the nest. "The shoreline pasture isn't used until the first week of July. By that time, these Piping Plovers have laid their eggs and their little ones are up and gone," says Songer.

"There's no reason in the world that we can't accommodate six to eight weeks for these birds."

However, Songer also had to consider the need for his cattle to have access to water while they were on pasture.

"The only concern that I had was the fact that I may run short of water. We've had no runoff. I have a full size dugout, and it's never filled," says Songer.

"If I run short of water, I have no choice - I have to go to the lake."

To this end, Songer constructed an alleyway to the lakeshore alongside an existing fenceline from his father's adjacent pasture, which gives both his and his father's cattle access to the water while minimizing their contact with the shoreline.

Through the project, Songer was also able to fence out an area of native prairie in his existing pasture. Songer manages this area carefully, only grazing it once every four years in order to give it time to recover.

"I only leave them in there for so many days, and as soon as I see that pasture down close to where I think it should go, out they go. They go to a different paddock," says Songer.

Songer adds that there is also a fenced area which has native tree and brush cover which acts as an ideal shelter for

the cattle in harsh weather. A portion of the land near this area has been seeded to fall rye, and is used for an early pasture. Songer plans to have cattle on this land by April 25th, which not only cuts feed costs but helps eliminate health problems that result from having the livestock in corrals during wet spring weather.

Overall, Songer is pleased with the benefits that have resulted from his efforts to change his pasture and shoreline management.

"We noticed a little bit of difference this year in the weight or the end result of our calves. The weights were slightly up. Of course, we also got a lot of rain this summer. The previous year we had little to no rain," says Songer.

"And we need to look after Mother Nature. There's no way around that one. There's other pastures along the waterfront now too which have been totally fenced out. And I think it's a good idea."

Plains Rough Fescue (*Festuca hallii*)

is a perennial grass that is densely tufted but also forms short creeping rootstocks. It grows up to 60 cm tall, and the base of the stems is often purplish. It is most easily recognizable by its leaf blades, which are very rough to the touch, and rolled so that they are nearly circular in cross-section. This grass dominates the "fescue prairie" of the black soil zone, although it decreases in abundance under heavy grazing pressure. It is also found in other parts of the prairies with adequate moisture, such as north-facing slopes.



Safe Access to Water Is Critical for Producer

Running a mixed farm operation on the south side of the North Saskatchewan River, father Winston and sons Aaron and Leon Hougham know the value of having a good supply of water for wintering cattle. They also know the benefits of ensuring their cattle have safe access to that water.

Together, the Houghams winter about 600 head on their farm, situated in the North Saskatchewan River Valley near Frenchmen Butte. In the past, the livestock were primarily watered at the river in the late fall and winter for a period of a month to six weeks. While convenient in some ways, this situation also presented difficulties.

"We used to fall graze over west, and we actually used to cut a hole in the river," says Aaron Hougham.

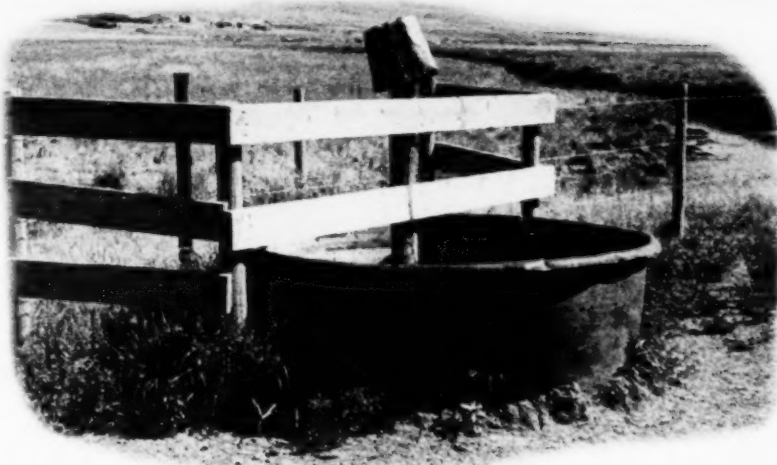
"System-wise, it definitely didn't work as well."

Aaron says the family has tried a number of different methods to manage the herd's access to the water over the years. One was, as mentioned, to simply cut an open hole in the ice. This not only meant that the hole had to be cleared of fresh ice each day, but there were also incidents where animals would get pushed into the hole and wouldn't be able to get out.

Winston Hougham later came up with an idea to carve a trough partway through the ice cover beside the river bank, with a small drain hole punched through to fill it. This eliminated the need for the cattle to actually venture onto the ice to get at the water, as well as the danger of having them fall into an open hole. However, ice on the slope of the bank still posed a concern.

"The problem was that the cattle were going down in there, and they'd have a tendency to slide down the bank. And they did manure on the ice a little bit," says Aaron.

"The biggest thing is that the cattle don't drink as well going out on the ice, or if it was a wintery day they might not come and then on the second day they would come and be all thirsty and be pushing



and whatnot, and there was a lot of chaos out there."

So the Houghams began looking at a number of ways to improve water delivery to the herd. The Saskatchewan Watershed Authority was able to assist the Houghams with installing a gravity fed remote watering system a few hundred yards from the river, with funding provided by Agriculture and Agri-Food Canada through the Agricultural Environmental Stewardship Initiative.

Two water lines were installed below the frost line to a dugout which feeds into a watering trough. The flow is controlled by a filtered hydrant, which can be connected to a float in the trough. The Houghams are experimenting with using a portable propane heater to keep the water in the trough thawed, and will see how this works on a four-, seven- or nine-foot tire trough.

Not only does this new watering site eliminate the problems that came with watering on the river, but it also decreases manure concentrations and reduces erosion along the streambanks caused by excessive trampling. The benefits of improved water quality will be enjoyed not only by the Houghams, but also by their neighbours downstream.

To Aaron, the project provides added benefits in terms of flexibility, as it meshes with other changes the family

has made or are planning to make in the future.

"If you can set up systems that are somewhat similar, and say when your cows move, with these little four-foot water troughs we can pick them up with the front end loader and move them at the same time that the cows move. The bigger troughs, they're heavy. Some of the big ones, you take out the centre and carry the cement and then carry the tire over, well that's not quite as portable," says Aaron.

"We're trying to work it to make a system that moves with the cows. Your permanent cribbing and your lines and infrastructure stay, but if you can move your trough and your propane heater at the same time, that's not a big thing."

Aaron notes that the project has not only been successful in terms of habitat preservation, but it has also yielded direct benefits for his own operation.

"We're trying to start to work at improving water for our cattle herd. You realize that it's not only a benefit to the watershed and the environment, but it's a benefit to your cattle as well. Your weight gain and the health of your livestock is better with clean water. So it's kind of a win-win situation."

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You can find more information on the Prairie Stewardship Program in back issues of this newsletter. These issues, as well as interactive maps featuring other stewardship project demonstration sites, can be viewed on our Web site at www.swa.ca.

Ryan Lorge

Coming Events

For more information on upcoming events please contact the following:

Moose Jaw
Jody Oliver at 694-3101

North Battleford
Jeremy Brown at 446-7460

Regina
Etienne Soulodre at 787-0661

Swift Current
Bob Springer at 778-8301
Krista Connick at 778-8280

Yorkton
Jason Puckett at 786-5845

Weyburn
Ross Macdonald at 848-2354



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- Agriculture and Agri-Food Canada through the Agriculture Institute of Management in Saskatchewan, Inc.
- Agricultural Environmental Stewardship Initiative
- Canada-Saskatchewan Agricultural Green Plan Agreement
- Canadian Adaptation and Rural Development in Saskatchewan
- Canadian Agricultural Rural Communities Initiative
- National Soil and Water Conservation Program and Prairie Farm Rehabilitation Administration
- California Waterfowl Association
- Canada Millennium Partnership Program
- Canadian Wildlife Service and World Wildlife Fund (Endangered Species Recovery Fund)
- Department of Fisheries and Oceans Canada
 - Ducks Unlimited Canada
- Environment Canada through Eco-ACTION
- Government of Canada Habitat Stewardship Program for Species at Risk
- National Fish and Wildlife Foundation (U.S.)
 - Native Plant Society of Saskatchewan
 - Nature Conservancy of Canada
 - Nature Saskatchewan
 - Nebraska Game and Parks Commission
- North American Wetlands Conservation Council
- Partners FOR the Saskatchewan River Basin
 - Pheasants Forever, Inc., (U.S.)
 - Prairie Conservation Action Plan
- Saskatchewan Agriculture, Food and Rural Revitalization
 - Saskatchewan Energy
- Saskatchewan Environment through the Fish and Wildlife Development Fund
 - SaskPower- Shand Greenhouse
 - Sask Water
- TD - Canada Trust Friends of the Environment Foundation
- Tennessee Wildlife Resource Agency
- The Nature Conservancy (U.S.)
 - Wildlife Habitat Canada
 - World Wildlife Fund
- Wyoming Game and Fish Department

Share Your Ideas!

If you have comments or ideas about this newsletter, please contact Ryan Lorge at 787-6958 or e-mail: ryan.lorge@swa.ca.

For specific information about the Prairie Stewardship Program, please contact Jennifer Lohmeyer at 787-8707 or e-mail: jennifer.lohmeyer@swa.ca.

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**Saskatchewan
Watershed
Authority**

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- Tennessee Wildlife Resource Agency
- The Nature Conservancy (U.S.)
 - Wildlife Habitat Canada
 - World Wildlife Fund
- Wyoming Game and Fish Department

Share Your Ideas!

If you have comments or ideas about this newsletter, please contact Ryan Lorge at 787-6958 or e-mail: ryan.lorge@swa.ca.

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